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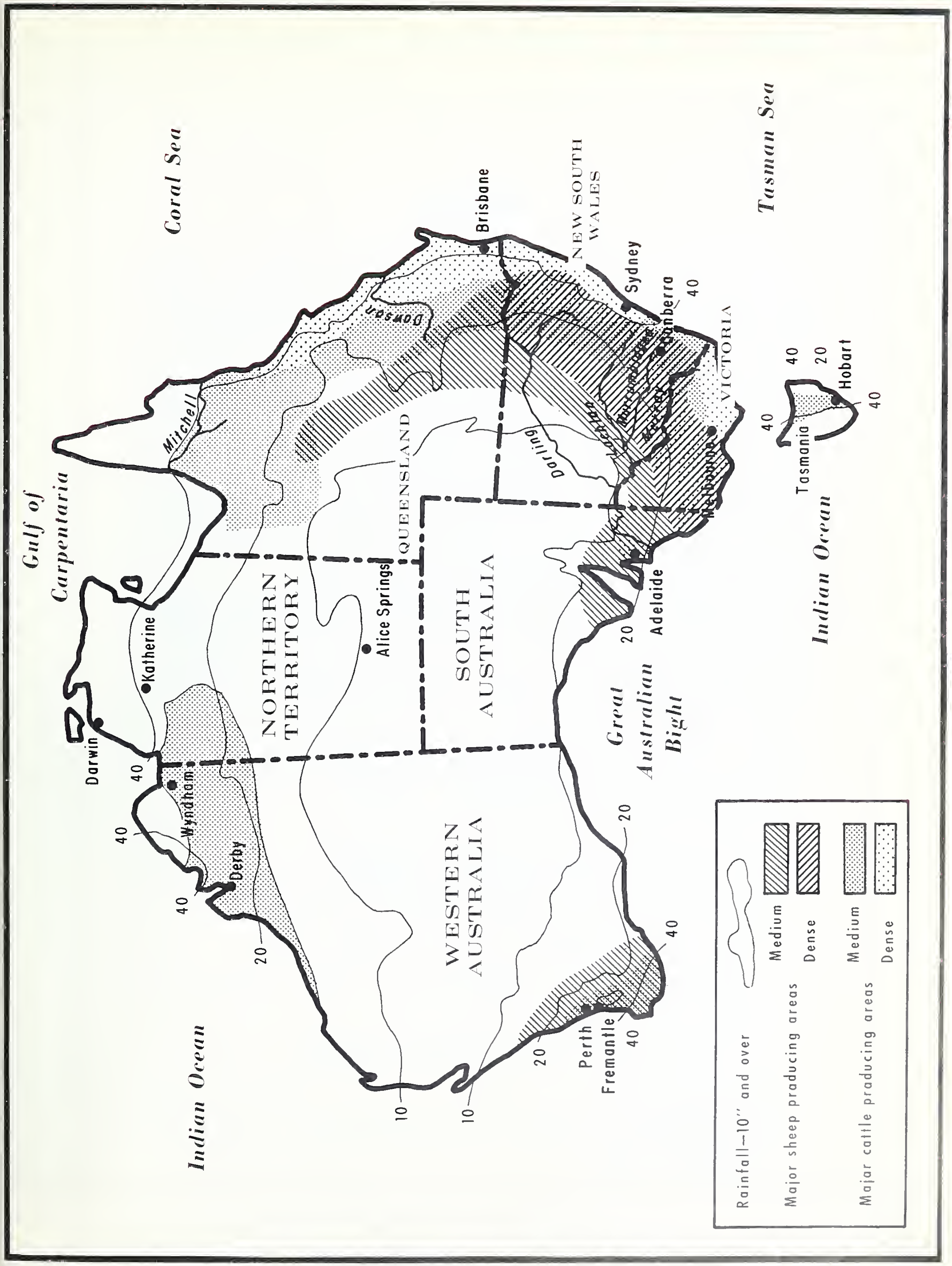
THE LIVESTOCK AND MEAT INDUSTRY OF AUSTRALIA

U. S. DEPARTMENT OF AGRICULTURE ▪ FOREIGN AGRICULTURAL SERVICE ▪ FAS-M-164 ▪ JULY 1965


Indian Ocean
Gulf of Carpentaria
Coral Sea
Tasman Sea
Indian Ocean
Great Australian Bight
WESTERN AUSTRALIA
NORTHERN TERRITORY
SOUTH AUSTRALIA
QUEENSLAND
NEW SOUTH WALES
VICTORIA
Tasmania
Darwin
Katherine
Wyndham
Derby
Alice Springs
Perth
Fremantle
Adelaide
Melbourne
Canberra
Sydney
Brisbane
Hobart
Mitchell
Dawson
Darling
Lachlan
Murrumbidgee
Murray
10
10
20
20
20
20
20
40
40
40
40
40
40
40
40
40
40
Rainfall—10'' and over
Major sheep producing areas
Medium
Dense
Major cattle producing areas
Medium
Dense

Preface

Australia has long been a major producer and exporter of animal products. To a degree, it has gained this position because the climate and soil of large areas, though not suitable for crop production, permitted large-scale raising of sheep and cattle on economic terms.

Over a third of the continent has an annual rainfall of less than 10 inches, leaving limited areas near the coasts to which agriculture is confined. The driest area is around Lake Eyre, South Australia, where the rainfall is about 5 inches per year. Evaporation exceeds the rainfall in more than 70 percent of the continent, and in many areas rainfall may be erratic, much of it falling within a few days, followed by long drought periods. Australia has reportedly had seven major droughts affecting most of the continent in the course of the past 100 years, in addition to other droughts occuring in restricted areas.

The soils of Australia are some of the oldest in the world—at least 2 billion years of age. Tending to be infertile, lacking in phosphorous and nitrogen, they sometimes create special problems in animal feeding. Improved pastures are, however, being established through the use of trace elements, superphosphates, and high production grasses and legumes. Much of the recent increase in Australian cattle and sheep numbers, particularly in New South Wales and in Victoria, may be attributed to such pasture improvement.

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G. M. Spurlock, Extension Animal Husbandman, University of California, Davis.

Foreword

Australia ranks first in the world as a wool producer and is a major producer and exporter of meat. Most of its surplus beef went to the United Kingdom before 1958. That year and for the next 5 years, shipments were shifted to the United States; but in 1964 a sharp reversal took place. With Europe needing relatively large imports of beef and with Argentina unable to supply these imports, Australia diverted substantial amounts of beef from the United States to European markets.

Current information on the livestock and meat situation in Australia and other important foreign producing countries is of paramount interest to the U.S. livestock industry. Thus, last fall, the Foreign Agricultural Service arranged with Reuben Albaugh, Extension Animal Husbandman, University of California, to undertake an on-the-spot study of the situation. The study had financial support from the University of California.

James P. Hartman

James P. Hartman
Director, Livestock and Meat Products Division

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THE
LIVESTOCK
AND MEAT INDUSTRY OF
AUSTRALIA

By: Reuben Albaugh, Extension Animal Husbandman, University of California

Introduction and Summary

Australia is the world's smallest continent, and also the least populated (3.35 persons per square mile, compared with 56.7 for the United States, which has about the same land area).

In 1964, Australia had 165 million sheep, about six times more than the United States; 28 percent of them were mature wethers kept mainly for wool production. The country is the world's major producer and exporter of wool, with about 95 percent exported. Sheep raising is also the most important source of rural income, accounting for 40 percent of total value of agricultural production, 1963-64. Sheep numbers have risen 46 percent since 1950.

In 1964, Australian cattle numbered 19 million head compared with 106 million for the United States; cattle populations have increased 30 percent since 1950.

Since the Australian domestic market does not demand a highly finished beef product, practically all the cattle are fattened on grass. In the United States, by contrast, two-thirds of the table beef consumed is from grain-fed steers and heifers.

Australian meat production, including beef, mutton, lamb, and pork, has increased 52 percent over the 1951–55 average, with practically all the increase taking place in beef.

Together with wheat, livestock and animal products comprise the bulk of Australia's export trade. Also, these products are of vital importance to world trade, since Australia supplies about two-fifths of the world's wool exports, and about one-eighth of its meat exports.

Wool is the country's major foreign exchange earner; in 1964, wool accounted for 38 percent of the total value of exports. Australia's total meat production in 1964 was 3.7 billion pounds, and domestic consumption 2.5 billion pounds, leaving 1.2 billion available for export.

The overall total of export meats showed an increase of 199 percent in 1964 over the 1951–55 average.

The United Kingdom was the main market for Australian beef and veal until 1960, when the U.S. market surpassed it. By 1964, for the year ending June 30, 1964, the United States absorbed 57 percent of the total export of meat. Beef and veal continued to be the major meats exported, accounting for 63 percent of the total.

The removal of restrictions in connection with the 15-year agreement with the United Kingdom, coupled with high prices in the United States, brought about this change. Shipments of beef and veal to the United States for the year ending June 30 in 1963 and 1964 were 467.7 million and 489.2 million pounds respectively. The latter was an increase of 318.4 million pounds over 1961.

As a major beef producing country, Australia will continue to offer competition to U.S. producers. Competition also will exist on products that the United States exports to other countries, such as beef, veal, variety meats, and tallow.

Australia will continue to maintain, expand, and improve its diversified export markets for beef, veal, mutton, and wool through the activities of the influential, powerful, and highly financed meat and wool boards. In recent years, the Australian Meat Board has been actively engaged in various programs designed to promote the sale of beef and mutton to markets other than the traditional purchasers of Australia's expanding export surplus.

Importance of the Livestock Industry

In 1964, beef and veal accounted for 8 percent of Australia's commodity exports. Wool accounted for 48 percent of the value of all agricultural exports.

On March 31, 1964, total Australian cattle numbers reached an alltime high of 19 million head. This was an increase of 30 percent over 1950. Numbers of beef cattle increased from 11.6 million in 1960 to about 14 million in 1964. Dairy cattle numbers remained unchanged. Pasture improvement, development of water supplies, road improvement, better herd management, and disease and parasite control all tended to increase carrying capacity of many properties. Time for finishing cattle for market was shortened.

Most of the beef cattle increase from 1961–64 occurred in New South Wales, Victoria, and Queensland. The Northern Territory and South Australia have not increased numbers materially since 1962. Queensland continues to be the leading beef cattle state with 39 percent of the total cattle population in 1964. New South Wales has 25 percent, followed by Victoria with 17.3 percent. This leaves 18.7 percent for the remainder of the country.

Beef cattle increased in the diversified farming areas where pasture improvement was the most extensive. Severe droughts prevented expansion of herds in the Northern Territory and some areas of Queensland.

In 1962, beef cow numbers constituted 50 per cent of the beef cattle population. Therefore, numbers may continue to increase, if prices are favorable and no severe droughts occur.

Some of the factors responsible for increase in beef cattle numbers are increased domestic demand for high quality beef and favorable prices for manufacturing beef in the United States. Domestic consumption of beef and veal increased about 8 per cent since 1961.

The main beef breeds are Shorthorn, Hereford, and Aberdeen Angus. In the north tropical areas, Brahman and Santa Gertrudis were introduced and are increasing in numbers. This increase occurred because these breeds are more resistant to heat and insects and can travel longer distances for water. Low fertility is a problem with some strains of the Santa Gertrudis. In some areas Brahman bulls are not able to compete with British-bred bulls when run together on the same property. Breeding with Brahman bulls in separate pastures corrects the problem.

At this time Shorthorns appear to be the most versatile breed. They are found in the tough desert country, in the tropics where they are crossed with the Brahman to produce the Drought-master breed. At Rockhampton Experiment Station, the Shorthorn x Brahman offspring outperformed all other breeds and crosses. In the dairy section, many Shorthorns of the milking strain are found.

In 1964, dairy cattle numbered 4,934,000 head.

TABLE 1.—Cattle and calves, sheep and lambs: Number on farms, total slaughter, and slaughter average 1951-55, annual 1957-64

Year	Cattle and calves			Sheep and lambs		
	Number on farms[1]	Total slaughter[2]	Slaughter as percent of number	Number on farms[1]	Total slaughter[2]	Slaughter as percent of number
Average:	*Mil. head*	*Mil. head*	*Percent*	*Mil. head*	*Mil. head*	*Percent*
1951-55	15.3	4.1	27	122.8	19.4	16
Annual:						
1957	17.3	5.0	29	149.8	20.2	13
1958	16.9	5.3	31	149.3	24.7	17
1959	16.3	5.9	36	152.6	27.6	18
1960	16.5	5.0	30	155.2	33.2	21
1961	17.3	4.3	25	152.7	32.6	21
1962	18.0	5.1	28	157.7	33.3	21
1963	18.5	5.9	32	158.6	33.8	21
1964[3]	19.0	6.3	33	165.0	33.5	20

[1] As of March 31. [2] Year ending June 30. [3] Preliminary.

Source: Australia, Commonwealth Statistician, Bureau of Agricultural Economics, Canberra, A.C.T.

These numbers have not changed significantly in the past quarter of a century. Since the demand for dairy products is not expected to change, the milk cow population may remain stable. Increased production per cow is expected to take care of the needs of increased human population. As in the United States, cull and aged dairy cattle furnish an estimated 25 percent of the beef and veal.

Australia is the largest sheep producing country in the world. In 1964, an alltime high of 165 million sheep was recorded. The trend in sheep numbers has been upward, an increase of about 9 percent since 1957. Throughout the history of the sheep business, droughts have altered the numbers greatly. For example, numbers dropped 23 percent after the drought in 1945–46.

Sheep numbers are greatest in areas that receive between 20 and 30 inches of rainfall annually. Temperatures also are important. Sheep populations can occur in areas of either high temperatures and relatively low rainfall or low temperatures in high rainfall. On the other hand, they are not raised to any extent in the high-temperatures and high-rainfall sections. Furthermore, the largest numbers of sheep are found in areas of perennial or self-regenerating pastures. They are not found in large numbers in the semiarid or arid sections.

The average fleece weight is about 10 pounds per sheep, but this varies among flocks, mainly because of nutritional differences. The Merino wether has the lowest maintenance requirement of any grazing animal in Australia. Even at a low plane of nutrition, this animal produces sound wool growth. About 28 per cent of the sheep population consists of wethers kept for wool production. In the sheep producing areas, sheep may return about 30 percent more income than beef cattle.

This country is the world's major producer and exporter of wool. About 95 percent of Australia's wools is exported. Sheep raising is the most important source of rural income, accounting for 40 percent of the total value of agricultural production in 1963–64. Wool is Australia's major foreign exchange earner, with exports in 1962–64 equal to 38

TABLE 2.—Cattle numbers by States, 1957-1964[1]

State	1957	1958	1959	1960	1961	1962	1963	1964[2]
	1,000 head	*1,000 head*	*1,000 head*	*1,000 head*	*1,000 head*	*1,000 head*	*1,000 head*	*1,000 head*
Queensland	7,462	7,187	6,884	7,012	7,004	7,098	7,234	7,402
New South Wales	3,911	3,736	3,663	3,841	4,242	4,399	4,569	4,789
Victoria	2,765	2,750	2,651	2,624	2,864	3,156	3,225	3,301
Northern Territory	1,176	1,244	1,099	1,110	1,154	1,063	1,087	1,055
Western Australia	957	997	1,000	1,030	1,100	1,218	1,298	1,299
South Australia	621	597	576	500	561	660	679	694
Tasmania	354	371	375	375	394	425	443	450
Australian Capital Territory	11	10	9	11	13	14	14	14
Total	17,257	16,892	16,257	16,503	17,332	18,033	18,549	19,004

[1] As of March 31. [2] Preliminary.

Source: Australia, Commonwealth Statistician, Bureau of Agricultural Economics, Canberra, A.C.T.

TABLE 3.—Sheep numbers by States, 1957-1964[1]

State	1957	1958	1959	1960	1961	1962	1963	1964[2]
	Mil. head	*Mil. head*	*Mil. head*	*Mil. head*	*Mil. head*	*Mil. head*	*Mil. head*	*Mil. head*
New South Wales	67.7	65.4	68.0	71.0	68.1	69.5	70.0	71.8
Victoria	25.8	27.1	26.9	26.6	26.6	27.5	27.5	28.4
Queensland	23.2	22.3	22.2	23.4	22.1	22.1	22.8	24.3
Western Australia	14.9	15.7	16.2	16.4	17.2	18.3	18.7	20.2
South Australia	15.0	15.2	15.6	14.0	15.0	16.4	15.7	16.4
Tasmania	2.9	3.3	3.5	3.5	3.4	3.5	3.6	3.6
Australian Capital Territory	.3	.3	.3	.3	.3	.3	.3	.3
Total	149.8	149.3	152.7	155.2	152.7	157.6	158.6	165.0

[1] As of March 31. [2] Preliminary.

Source: Australia, Commonwealth Statistician, Bureau of Agricultural Economics, Canberra, A.C.T.

percent of the total value of all commodities exported. This is a reduction of 4 percent compared to 1959–61. The large increase in beef exports may account for this decrease. New South Wales has the largest number of sheep, with 71 million, or about 44 percent of the total.

In 1963, the sheep population consisted of 50 percent ewes, 28 percent wethers, 1 percent rams, and 21 percent hoggets and lambs. Wether flocks are important for wool production, especially in the hotter drier areas when breeding ewes have been found to be unprofitable.

In 1962–63 a total of 45 million lambs were marked. Since 50 percent (82 million) ewes are kept, this would indicate a low percentage of lamb crop. Most Merino lambs are kept for flock replacement rather than for slaughter. Mutton and lamb production per head of sheep in Australia has been low compared to other countries. Generally, in the United States, lamb production for meat is more important than wool production. Domestic lamb consumption in Australia has increased from 28 pounds per capita in 1957 to 41 pounds in 1964. During the same time, exports dropped from 54 to 41 million pounds. With the big push for higher stocking rates in areas where pasture improvement is practiced, more fat lambs could be produced.

The Merino is the most popular breed of sheep, accounting for three-fourths of the total. About 11 percent are purebreds, mostly Corriedales, and the remainder are crossbreds.

Hog production in Australia is small compared to cattle and sheep. Numbers have declined from 1.8 million in 1941 to 1.47 million in March 1964. Domestic consumption of pork, at 11 pounds per person, is up 2 pounds since 1957 but down 2 pounds since 1962. Exports of pork have declined from 2.2 million pounds in 1957 to 0.7 million in 1964. Most hogs are raised on dairy farms where they are fed skim milk and some cereal grain.

Production Patterns and Practices

Most cattle and sheep stations tend to be large compared to those of the United States.

Four classes of graziers were named in a recent study by the Commonwealth Scientific Industrial Research Organization (CSIRO):

(1) The small owner with one property.
(2) The large owner or pastoral company that may hold a group of properties.
(3) Pastoral companies which own a chain of properties but which are interested only in grazing.
(4) Pastoral companies which own a chain of properties, but which in addition are part or sole owners of a packing plant.

Each of these graziers has an important function in harvesting the crops on these remote land areas, and to some extent they are dependent upon each other in transporting and marketing their animals.

In some states, such as New South Wales, cattle and sheep may be grazed together. This practice is said to increase carrying capacity and production per acre. Sheep are more selective in their grazing habits—eating the young, tender, and finer plants, while cattle, being less selective, will graze the rougher and coarser feed. In some areas, dairy farmers are raising beef cattle.

Since the Australian domestic market does not demand a highly finished beef product, practically all of the cattle are fattened on grass. In the United States, on the other hand, two-thirds of the table beef consumed is from grain-fed steers and heifers. In 1964 in the United States, about 25 percent (4.4 billion pounds) of beef[1] was sold in the form of hamburger. As the result of several experiments, it is considered uneconomical to fatten cattle on grain in Australia.

Several million acres, mainly in Queensland and New South Wales, are being devoted to the production of hay and green fodder crops. Cattle are fattened on these areas. This practice is apt to expand as more areas are developed for these kinds of crops. There is a rapid and extensive development of improved pasture in the southeastern part of the nation and in those parts of Western Australia where rainfall is adequate. This improvement is accomplished by clearing, seeding to proper legumes and grasses, and fertilizing with phosphorus and, in some areas, with trace elements. Improved pasture acreage is thought to be several times larger than that used for crop production. To a limited extent, dry range grasses are supplemented with some high protein-phosphorus feed. Molasses-urea blocks sometimes are used. In the United States, supplementing cottonseed cake is a common and profitable practice.

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[1] Includes all chopped beef sold as hamburger, or as chopped beef.

In the drier parts of Australia, the construction of reservoirs and wells for stock water has been expanding. However, more water is needed in some areas. Cattle that have to walk more than 3 miles to water seldom gain much weight. Sheep, however, can go longer distances for water. This water development has reduced stock losses and expanded areas for grazing.

Biological control of rabbits with the virus myxomatosis has greatly increased livestock feed. Because some persons fear that this animal is developing an immunity to this disease, a poison called "1080" is now being used.

In the past, kangaroos and wallabies consumed large areas of range feed, but are now held in check by hunters. Dingoes or wild dogs are a serious menace to sheep and, in some instances, to cattle. A 3,500 mile dingo-proof fence has been completed in Queensland by independent producers and the state government.

Few sheep are raised in the coastal and northern parts of Queensland, Northern Territory, and Kimberley area of Western Australia, mainly because of climatic conditions, spear grass, and dingoes.

A large portion of Northern Australia is infested with ticks that cause tick fever in cattle and horses. Ticks thrive best in hot, humid areas. They can be controlled by dipping. Several treatments are required per season. The tick has not been eradicated because all animals in the infested areas cannot be mustered for treatment. Strict quarantine measures are enforced by the government to prevent the spread of ticks and pleuropneumonia. Both increase costs and hamper production. Tick fever was eradicated in the United States about the turn of the century.

In northwestern Queensland, Northern Territory, and parts of Western Australia, most properties raise a 45 to 55 percent calf crop to branding age. A number of properties sell few females—most of these, on the contrary, die on the property. A standard practice in some properties is to write off a 12 to 15 percent mortality each year. It is strongly suspected that infertility diseases, such as vibriosis, are one main cause of low calf crops. Calves born in the hot, dry period before Christmas may die; this late calving practice may account for high female mortality.

Drought

Long dry seasons that occur north of the Tropic of Capricorn will continue to hamper livestock production. Coping with these adverse weather conditions is a difficult and expensive task. CSIRO suggests the following recommendations to growers for dealing with the dry periods. These suggested practices, if followed, will have a strong influence on increasing production of meat and wool.

1. Insure that water supplies are adequate for drinking requirements.
2. Wherever possible, conserve and use water for irrigation; and during period of nutritional stress, ration the high-quality feeds so produced.
3. Ration improved pastures and extend their area where practicable.
4. Plan the feeding program as far ahead as possible.
5. Accustom sheep to hand-feeding, but do not waste supplies of conserved fodder by feeding before necessary.
6. Consider drought-feeding problems quantitatively.
7. Grade stock according to condition, and ration accordingly.
8. Consider the value of sheep to be fed, and ration feed accordingly.
9. Feed at periodic intervals instead of daily (except early-weaned lambs which should be fed ad lib,[2] if feed supplies are adequate).
10. Wean early, and completely hand-feed lambs. Discontinue hand-feeding when it is practicable to do so.
11. Make use of low-quality roughage.
12. Ration high-quality supplements.
13. Ration protein-rich supplements.
14. Add urea to grain supplements, especially if the quality of the roughage is poor, but use it carefully because of the dangers associated with overfeeding urea and faulty mixing.
15. If necessary, add limestone to grain supplements. This can be important for young growing stock, and for pregnant ewes fed mainly on grain rations.
16. If necessary, drench with a vitamin A supplement. This should be necessary only under conditions of protracted periods of grazing on dry feed, and even then only with lambs, weaners, and rams which are to be used for breeding.
17. Where practicable, consider the merit of completely hand-feeding a portion of the

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[2] As necessary, according to the number of lambs in the flock.

flock in a restricted area, and thereby distributing the remainder of the flock more thinly over the property.

18. If you must buy feed, and if there is a choice of several fodders, make sure that the purchase is basically sound.

Costs of beef production

Because of Australia's size, varied climates, quality and type of soils, and water, together with the human management element, it is almost impossible to arrive at an average or representative figure for livestock production costs. This would be true also for a country such as the United States.

A CSIRO study cites two cost examples—one in Rockhampton and the other in the Kimberley area. These are two extremes in cost range. For 1954, it is estimated that the cost per head per annum in the more developed Rockhampton area was about $10.80, for cow-and-calf operation. On the undeveloped Kimberley property, the cost per head per year was estimated at $3.12. The gross profit, however, is determined by percentage of turnoff as well as weight of turnoff. Production costs would be much higher in 1964.

TABLE 4.—Costs of Beef Production: Capital investment and operating costs on an Animal Basis

Capital investment	Gulf	Central Queensland	Southern Queensland
Size of operation:	*Animal units*	*Animal units*	*Animal units*
	4,570	940	818
	Dollars	*Dollars*	*Dollars*
Livestock	49.66	57.74	78.48
Improvements	10.56	26.88	67.07
Plant	3.44	6.65	13.00
Total	63.66	91.27	158.55
Operating costs:			
Labor	2.29	2.44	3.28
Fuel	.31	.63	2.05
Repairs	.59	1.37	1.64
Fodder	.07	.13	.27
Dips	—	.55	—
Freight	1.31	.87	3.10
Commission	.52	.74	1.48
Overhead	.37	.71	1.31
Rent	.26	.68	.79
Taxes	.30	.57	1.20
Labor, Operating	.86	4.17	4.79
Depreciation	.81	1.49	2.42
Interest	3.58	5.13	8.92
Total	11.27	19.49	31.27

Source: Australia, Bureau of Agricultural Economics, Canberra, A.C.T.

The net weight gain of male cattle in the Charters Towers area is 200-250 per year for fat 4½-year-old steers, or an average weight gain per day of 0.5–0.7 pound according to the Queensland Dept. of Primary Industries. Cost per head per year for the years 1960–64 was $7.45. This did not include salary for managers or interest on investment.

The Australian Bureau of Agricultural Economics estimates the volume of production as well as costs of producing beef in three areas of Australia—namely, Gulf, Central, and Southern Queensland. The production of carcass beef per animal in herd of these three areas was 89, 101, and 109 pounds, respectively. The cost per pound of carcass beef, which includes interest on investment at 5 percent, depreciation, and operator's labor, was found to be 10.8, 15.7, and 16.4 cents for Gulf, Central, and Southern Queensland respectively. Table 4 gives a breakdown on capital investment, operating costs, and beef production.

TABLE 5.—Costs: Production costs of Australian beef exported to the United States from Queensland

Producing area	Cost per 100 lb.		Add $4.20 per 100 lb. boneless for boning, etc.[1]
	Dressed weight, bone-in at slaughterhouse	Boneless	
	Dollars	*Dollars*	*Dollars*
Gulf	10.75	19.38	23.58
Central	15.79	28.45	32.65
Southern	16.35	29.46	33.66

[1] Boneless beef wrapped and cartoned at the slaughterhouse. Source: Australia, Bureau of Agricultural Economics, Canberra, A.C.T.

Producing units

In 1956, a total of 83 per cent of the occupied grazing lands in Queensland and all those areas in the Northern Territory and Kimberley were held or controlled under Crown leases, according to the Queensland Department of Primary Industries. The terms of the Queensland leases usually were for 28 to 30 years in 7-and 10-year periods. Rent could be reassessed at the end of each period, and one-fourth to one-third of the holding could be taken back by the Crown. Pastoral companies have no right for renewal of their leases, but individuals can secure a "homestead block" or living area at the end of their lease. When losing a lease, the tenant is entitled to be compensated for any improvements, but only to the extent of their value to the new tenant. If land is cultivated for drought supplement crops, this area is leased at a higher figure.

Because of these and other uncertain factors, land leasing has limited progress in the grazing areas. To some extent, these policies have discouraged graziers from undertaking improved breeding methods, land development, and, in some instances, have encouraged a neglect of the properties in the last stage of the lease.

Although conditions vary widely from one part of the country to another, livestock properties generally are large. In the more developed southeastern part of Australia, they range up to 5,000 acres, with holdings of less than 700 acres regarded as too small for successful operation in many sections.

In central Queensland, holdings of 20,000 acres are common, while in the northern and western part of the state properties frequently exceed a quarter million acres. In the Northern Territory, as well as in the Kimberley region of Western Australia, a number of cattle stations have 5,000 square miles, or more than 3 million acres. Carrying capacity of this area is limited by a long dry season to as few as six head per square mile. Attempts to operate units of fewer than 1,000 square miles frequently have been unsuccessful. Most of the properties in this region are held by large corporations.

In Queensland, the main beef cattle producing state, there are three main sources of available land:

1. Freehold, bought or leased from the owners.
2. Crown land, government owned land not already leased, which can be obtained under one of a number of tenures, mainly leasehold.
3. Land held in lease from the government, transferred to another person under certain circumstances.

The Queensland government does not provide any special financial assistance for land settlement. However, for the Fitzroy development project, the Commonwealth government expects to spend $15 to $20 million in the next 5 years.

Land development in central Queensland in the Fitzroy River Basin may be used as an example. The area is composed of 4,271,000 acres. The plan is to develop holdings of about 10,000 acres each, capable of running 800 head of cattle. The tenure will be in the nature of a purchase lease, a freeholding tenure with the lease not exceeding 25 years. The purchase price will be between $3 and $5.40 per acre and will be due at the commencement of the lease. The cost of clearing is between $15 and $30 per acre. This amount can be borrowed from the land administration commission, repayable in annual installments without interest over a 25-year period. Each applicant must have assets or cash of about $25,000 to establish equity in the land, erect buildings, and buy stock. Further loans up to $50,000 are available from the commission for land development, at 5½ percent interest.

Research

In Australia there are three major groups interested in research, teaching, and extension: the Commonwealth Scientific Industrial Research Organization (CSIRO), universities, and state departments of agriculture. The state departments are financed through state funds, while CSIRO is financed by the federal government. Universities are jointly financed, while large contributions by producers are made to all groups. Extension work is under the direction and supervision of state departments of agriculture. There is no land-grant college system in Australia. Each university works independently on its research and teaching assignments; however, universities do exchange the results of this research as well as information on their teaching methods.

Private agricultural consulting agencies are becoming popular. One well-trained agent will serve about 40 farmers. Fees for services are based on the size of the property.

Extensive basic and applied research is being conducted by all of these agencies in all aspects of animal science, including nutrition, physiology, animal breeding, and also in pasture management. All these agencies have staffs of highly trained, dedicated scientists. There is much current interest in the field of beef cattle nutrition, especially fattening operations. A summary of current investigation in this field is given below.

Since the rainfall in many areas of Australia is low and erratic, nutrition is one of the main problems in the production of livestock. Although ample energy intake is the principal feed problem, the lack of protein, phosphorus, copper, and cobalt also retards production. In some areas, an excess of molybdenum is a serious nutritional problem, a University of Hawaii study has shown.

Much research work has been conducted on the use of urea to correct nutritional deficiencies. Molasses-urea mixtures, as well as 30 per cent urea mineral blocks, have been fed. Although some toxicity problems have occurred when feeding urea, most of the results have been favorable.

There is considerable interest in feedlot finishing of beef cattle in Australia. Because of the price relationship between feeds and carcass beef, it is doubtful if such a practice will be profitable. Better quality beef is bringing about 20 to 22 cents per pound on a carcass weight basis, although cereal grains are between $50 and $60 per ton. Protein supplements are more expensive than grains. Unless the Australian housewife demands beef of a higher finish, the long-term high energy feeding of beef cattle appears to be out of the question.

Dr. M. C. Franklin, of the CSIRO staff, speaking before the Royal Agricultural Society of Queensland, on April 11, 1964, made the following comments about marketing grain through meat (Franklin's comments are used as an example of the interest and trends in beef production in Australia.)

1. Pasture is our cheapest fodder, and we will maintain our position as a world producer of cheap meat by continuing to exploit pasture improvement and usage to the limit. It is encouraging that so many exciting developments in this field are taking place in Queensland.
2. Unfortunately, the quality and yield of pasture varies widely throughout the year, and even improved pasture, (except in very favored areas) . . . is not able to satisfy production or sometimes even maintenance requirements during some periods. . . . Alternative ways of feeding livestock through these periods of nutritional stress will be adopted more widely as the economic changes in the industry focus more attention on the need.
3. Crop fattening is, of course, one of the obvious answers . . . and this can be expected to increase.
4. Feedlot fattening, or "topping-off" by complete hand-feeding, will assume increasing importance. The industry is not yet ready, however, to adopt this on a large scale. Where it is used, special care should be exercised to exploit the use of cheap fodders.
5. Finally, as feedlot fattening increases, many changes will be necessary:
   a. It will be imperative that more attention be given to better fodder conservation, or perhaps I should say *more* fodder conservation. The amount of fodder conserved and retained for stock feeding in this state is still deplorably low.
   b. More attention will have to be given to basic nutritional information. Impressing the visitor to the feedlots in the United States is the standard of knowledge of many feedlot operators on relative fodder values, the price which should be paid for them, how feeds should be blended to provide balanced mixtures, and how nutritional deficiencies can be corrected. The margin of profit there is often so narrow that these operators have been forced to acquire this knowledge and apply it.
   c. As feedlot fattening increases in Australia, it will become increasingly important to pay more attention to factors affecting efficiency of feed conversion—the pounds of feed per pound of gain. Many things can affect this—the quality of the feed, the relative proportions of roughage and concentrate, the overall protein content of the ration, the protein content of the grain, the source of protein supplements, mineral imbalance in the ration, the vitamin A status of the animal on feed and the carotene content of the ration, antibiotics and other additives, the physical nature of the feed, and a number of other factors can influence food consumption and, therefore, efficiency of feed conservation.

Many at present are satisfied if hand-fed cattle are putting on 2-to-2½ pounds gain per head per day for an expenditure of 8 to 10 pounds of feed per pound of bodyweight gain. Research is pointing the way to substantial improvements in these figures, and practical feeders can be expected to move toward these higher goals as our nutritional knowledge improves and as existing information is applied more widely in Australia's livestock industry.

Meat Production

Meat production, including beef, mutton, lamb, and pork, has increased from 3,356 million pounds in 1962 to 3,727 million in 1964. Practically all of this increase was in beef, which amounted to 400 million pounds more than the 1962 production.

The change represents an increase of 52 percent over the 1951-55 average.

It is estimated that the total red meat production

TABLE 6.—Meat: Australian production by kind, average 1951-55, annual 1957-64

Year[1]	Beef & veal	Mutton	Lamb	Pork	Total
	Mil. lb.[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]
Average:					
1951-55	1,492	509	253	195	2,449
Annual:					
1957	1,825	502	320	199	2,846
1958	1,773	604	340	227	2,944
1959	2,030	695	408	228	3,361
1960	1,684	830	455	225	3,194
1961	1,417	823	463	241	2,944
1962	1,772	824	490	270	3,356
1963	2.047	812	517	256	3,632
1964[3]	2,172	810	497	248	3,727

[1] Year ending June 30. [2] Product weight. [3] Preliminary.
Source: Austrailia, Commonwealth Statistician, Bureau of Agricultural Economics, Canberra, A.C.T.

for the fiscal year 1964 was to be 58.3 percent beef and veal, 21.7 percent mutton, 13.3 percent lamb, and 6.7 percent pork. These figures show an increase of about 5.8 percent in beef and veal over 1963, and a slight decrease for the other meats.

Canned meat production declined from 178.7 million pounds in 1958 to 99.3 million pounds in 1964. Only about one-tenth of the canned meat production is consumed locally.

Beef and veal production will have reached an alltime high in 1964, approximately 2.17 billion pounds. The increase in cattle slaughter is caused by favorable prices and by marketing at younger ages. More favorable transportation and increase in production per unit account for increased tonnage.

Sheep and lamb slaughter amounted to 33.5 million head in 1964, or 810 million pounds of mutton and 497 million pounds of lamb in 1964. This is an increase in number slaughtered of 73 percent over the 1951-55 average. Lamb and mutton production for 1964 is expected to be 1.3 billion pounds, or about the same as in 1962.

Hog slaughter in 1964 is estimated to be 248 million pounds. This is a decrease from the 270 million pounds in 1962, which was an alltime high record. This record slaughter was brought about by forced marketing owing to a hog cholera outbreak.

TABLE 7.—Canned meat: Australian production by kind, 1957-64[1]

Commodity	1957	1958	1959	1960	1961	1962	1963	1964
	Mil. lb.[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]
Canned beef	37.3	37.4	33.3	20.7	16.0	20.0	23.2	16.6
Minced beef loaf	23.7	23.8	17.4	14.3	9.7	9.1	5.1	12.6
Other beef	40.4	47.1	49.5	24.3	17.0	11.6	10.5	14.4
Corned mutton	1.7	8.4	5.2	13.6	5.1	11.5	2.6	2.7
Other mutton	9.3	14.1	16.1	25.9	10.3	12.6	6.0	6.2
Bacon and ham	7.9	8.6	8.9	7.4	7.3	9.6	8.0	7.1
Other pork	.3	.3	.4	.3	.8	.8	.6	.2
Camp pie[3]	7.8	13.2	9.3	10.1	10.4	10.0	10.4	9.4
Other mixed meat	6.5	8.7	4.8	13.5	13.8	7.5	5.3	3.9
Sausage	1.3	.9	1.8	1.8	1.1	.8	1.3	1.0
Meat and vegetables	14.3	16.2	18.9	24.7	20.0	23.7	22.5	25.2
Total	150.5	178.7	165.6	156.6	111.5	117.2	95.5	99.3

[1] Year end June 30. [2] Product weight. [3] Mixture of ground meat and cereals.
Source: Australia, Commonwealth Statistician, Bureau of Agricultural Economics, Canberra, A.C.T.

Marketing

Wool

Australia produces about 30 percent of the world's output of apparel wool, and is the world's largest wool-producing country. Australia's wool trade was built on volume as well as quality. Merino and crossbred wools are produced; Merino wools are fine, high in quality, and used mainly for manufacture of high-quality fabrics. Wool production for 1965 is forecast at 1.8 billion pounds. This is an increase of 1.1 percent over the 1964 record, and an increase of about 209 million pounds over 1959 production.

Increase in wool production, for recent years, is shown by tabulation on the following page.

	Mil. lb.[1]
Average:	
1951-55	1,202
Annual:[2]	
1957	1,564
1958	1,434
1959	1,591
1960	1,680
1961	1,625
1962	1,699
1963	1,673
1964[3]	1,782

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[1] Greasy basis.
[2] Year ending June 30.
[3] Preliminary.

Source: Australia, Commonwealth Statistician, Bureau of Agricultural Economics, Canberra, A.C.T.

Wool is produced in all the states. New South Wales, the leading producing area, accounts for about 40 percent of the clip. Victoria is second, and Queensland third.

About 90 percent of the wool produced in Australia is sold at auction to the highest bidder through a broker. The seller may place a reserve bid on his wool; this affords him an opportunity to sell at a later date if his bid is not met.

Sydney is the world's largest wool-selling center, with more than 1 million bales (300-pound average) sold annually. Wool also is sold in other state capitals. It is sold in large lots of 5 or more bales and in star (smaller) lots. Quite often wool lots from several producers are combined to form composite large lots. From 400 to 600 lots may be sold per hour. Brokers attempt to market wool in an orderly fashion by setting up selling schedules well in advance of the market season. As estimates of production change, revisions in market plans may be made.

Australian sheep producers take great care in preparing and packaging their wool. Because of this, their wool generally commands a premium price at the Boston market over U.S. wool of the same grade.

Before being sheared, the sheep usually are sorted according to age and sex. Wool from rams, ewes, wethers, yearlings, and lambs is kept separate. The shearer first clips the wool from the brisket, belly, britch, and the inside of the legs; this is graded separately from the main fleece, which is sheared in one piece. The fleece is skirted, folded and rolled, but not tied. In the United States, wool is only folded and tied. The fleece roll then is graded on quality characteristics and baled with other fleeces of the same commercial classification. The bale is labeled with the producer's name and district and the commercial class, given a serial number, and then shipped to a broker's warehouse at one of the auction centers, together with the classer's report of the type of wool. The buyer, who is familiar with the climatic and growing conditions in the area, has a good idea of the conditions of the clip before he inspects it in the broker's warehouse.

The main function of the wool broker is to display and sell the wool-grower's clip. Brokers' charges, including commission, handling, and delivery charges vary with different states and the quantity handled. Total charges for these services are about 2 cents a pound. The broker also provides classers to cull the flock and classify wool at shearing time, and may provide financing and other services to the growers. He also may deduct from the grower's returns any charges paid on the grower's behalf, such as those under the Wool Tax Act, or charges for freight and insurance.

Transportation charges from an Australian pool to one in the United States amount to about 5 cents a pound, grease basis.

Livestock

The custom of driving cattle several hundred miles to market in northern Australia gradually is giving way to hauling by motor trucks. By 1964, more than one-half of the cattle in that area were transported by truck. Construction of new and better roads will further increase truck movement.

In other parts of the country, most sheep and cattle are moved by rail rather than by truck or driving. Railroads are state owned, so the government discourages competition between railroads and truck lines by charging trucks a high "road tax" for using roads between rail points. This tax does not apply to interstate commerce.

Because railroad cars are smaller than those used in the United States, they hold fewer animals. Since railroads have different gauge tracks from one state to another, livestock must be reloaded at state junctions. Transporting livestock by rail is rather expensive, one reason being that locomotives are of the steam-driven coal-burning type. This should cause transporting by truck to become more popular.

There is a growing trend to market for slaughter younger animals between 12 and 15 months of age to meet the growing demand for higher quality meat on the domestic market. Such a practice hastens turnover of numbers, produces a more efficient animal, and allows for breeding cow numbers to be increased. In many areas, this should be a more profitable practice than selling aged cattle. Boneless beef for the U.S. market is obtained from cull cows, old bulls, and 4- to 5-year-old steers. On some stations, old cows and bulls that formerly were allowed to perish on the range are being salvaged because of improved marketing transportation and increased prices.

Lambs are slaughtered at 4 to 5 months of age, and most of this production is consumed locally. In 1964 only about 8 percent was exported. Boneless mutton is produced from old ewes and wethers and exported mainly to the United States and Asian markets.

The auction sale is the main marketing system for most livestock in Australia. An agent sorts the animals into salable lots, conducts the auction, and records the proceeds. For this service he charges a fee. Cattle and sheep are sold by the head, pigs by weight. In the United States, most of the feeder and fat cattle are sold by the pound, breeding cattle by the head. The same is true for sheep and hogs. In Australia, there is some trading of livestock between ranches, and some of the livestock are sold directly to slaughter.

Meat

Inspection and Grading.—Meat inspection is conducted by the Commonwealth Meat Inspection Service, Department of Primary Industry, as well as by some states and a number of counties. All meat intended for export is subject to rigid export regulation (Statutory Rules 1961, No. 93). Export firms must maintain sanitary conditions or have their licenses revoked. Many slaughtering plants have been remodeled and are quite modern in facilities and equipment. These inspection methods and standards of hygiene are strict, and about the same as those prescribed in the U.S. regulations.[3]

Australia is an approved source for meats imported into the United States. To be eligible to export meat or meat food products to the United States, interested foreign countries must apply for and receive recognition of their national meat inspection programs. The U.S. Department of Agriculture (USDA) will approve a foreign meat inspection system if it is adjudged to be the substantial equivalent of, or as efficient as, the system maintained and operated in the United States.

Official establishments engaged in exporting the product to the United States must be certified to the USDA as fully meeting specified requirements for this purpose. The certification is made by a responsible official of the foreign meat inspection organization. Such foreign establishments are subject to USDA observation and review at stated times. Each consignment of foreign product offered for importation is accompanied by an approved meat inspection certificate issued by the national government of the country of origin. The certificate certifies that the meat or meat products were derived from animals that received antemortem and postmortem veterinary inspection, and that they are sound, healthful, wholesome, and fit for human food, are unadulterated, are truthfully labeled, and were handled only in a sanitary manner in the foreign country. This places the responsibility on the foreign officials to certify only product which meets U.S. standards.

An import inspection of all shipments of meat or meat products offered for importation is conducted by inspectors of the USDA Meat Inspection Division. A suitable number of unit packages, sufficient to be completely representative of the lot, is withdrawn, opened, and examined. The size of such sample, other than canned products, may be 10 percent of the lot, or less or more, at the discretion of the inspector. Frozen product is defrosted for inspection when necessary. The initial inspection of foreign canned product consists of a 5 percent sample inspection.

As part of the import inspection, samples may be submitted to the USDA laboratories for species identification and for detection of possible toxic residues. Other tests may be requested by inspectors as an aid to determining disposition of shipment. No reconditioning of imported meat is permitted. Acceptance or rejection of a consignment is based upon the result of examination of representative samples.

As in the United States, some meat packers fatten their own cattle to insure a regular supply of animals. Some plants are owned by municipalities and do custom slaughtering. This marketing system is more common than in the United States. Export meat is inspected by the Commonwealth inspection officials. As carcasses reach the end of the slaughter line, they are weighed and graded. Each carcass is tagged, showing grade and official inspection certificate.

Export beef has three basic grades: first, second, and third quality, the latter being for manufacturing purposes. Beef, lamb, and mutton shipped to the United Kingdom or the United States must be stamped to denote country of origin. Labels on stockinettes of chilled or frozen carcass meats and on the cartons of boneless meat are printed in distinctive colors: Blue, first quality; Red, second quality; and Black lettering, third quality.

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[3] As outlined in USDA Agriculture Handbook No. 191.

Milk lamb carcasses are smaller, younger and, therefore, somewhat leaner than those produced in the United States. Those sold on the domestic market are labeled to protect the consumer. Yearlings and muttons are not labeled. Wholesale trade is conducted much as in the United States. Meat is sold at the retail level by specialized butcher shops. Prepared packaged cuts are not common in Australia, but are expected to increase with the coming of supermarkets. These retail outlets are now being established. For example, a large U.S. chain is now constructing six supermarkets in Melbourne.

Domestic consumption.—In 1964 there were 11,135,509 people in Australia, compared to 8,986,530 in 1954—an increase of 19 percent or about 2 percent per year. This percentage increase is similar to the U.S. population growth rate. Assuming annual immigration will be 100,000 and the rate of natural increase will be maintained, Australia's population should reach 14.5 million by 1975. Per capita consumption of beef and veal dropped from 129 pounds per person in 1957 to 86 pounds in 1961, and then increased to 101 pounds in 1964. Mutton consumption remained quite stable throughout the 8-year period, while lamb consumption increased from 28 pounds in 1957 to 41 pounds per person in 1964. This increase in lamb consumption occurred because lamb and mutton were available economically to the consumer.

TABLE 8.—Meat: Estimated Australian total and per capita consumption, by kind, 1957-64[1]

Commodity	Wgt. Unit	1957	1958	1959	1960	1961	1962	1963	1964[2]
Total:		*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*
Beef and veal	Bone in	1,229	1,219	1,170	1,000	887	985	1,063	1,108
Mutton	do	446	494	549	648	656	586	563	516
Lamb	do	264	277	317	396	397	456	449	452
Pork	do	83	105	106	105	119	139	131	119
Variety meats		99	115	121	118	113	119	130	140
Canned meat	Canned	34	44	47	42	43	41	43	([3])
Bacon and ham	Cured	65	68	72	72	71	74	79	([3])
Total	Carcass	2,264	2,383	2,438	2,426	2,330	2,455	2,510	([3])
Per Capita:		*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*
Beef and veal	Bone in	129	125	118	98	86	93	98	101
Mutton	do	47	51	55	64	63	55	52	47
Lamb	do	28	28	32	39	38	43	42	41
Pork	do	9	11	11	10	11	13	12	11
Variety meats		10	12	12	12	11	11	12	13
Canned meat	Canned	3	5	5	4	4	4	4	([3])
Bacon and ham	Cured	7	7	7	7	7	7	7	([3])
Total	Carcass	237	245	245	239	224	232	232	([3])

[1] Year ending June 30. [2] Preliminary. [3] Not available.

Source: Australian Meat Board, Sydney.

The Export Market

The Wool Board

The Wool Industry Act was passed in 1962, and the Australian Wool Board was formed a year later. The specific powers of market investigation conferred on the board are "to inquire into and from time to time report to the Australian Wool Industry Conference upon methods of marketing wool and other matters connected with the marketing of wool."

The board is made up of 11 members: a chairman, six wool growers nominated by the Australian Wool Industry Conference, three members appointed by the conference and the Minister for Primary Industry, and one member representing the Commonwealth Government. All members including the chairman are appointed finally by the Minister of Primary Industry.

The principal functions of the board are:

1. To promote the use of wool in Australia and other countries.

2. To investigate wool marketing.
3. To decide the policy of the Australian Wool Testing Authority's operations.
4. To recommend wool research expenditure to the Minister for Primary Industry—with the advice of the Wool Research Advisory Committees.
5. To administer the wool stores erected during World War II for the wartime wool purchase scheme.
6. To administer the Wool Statistical Service.
7. To perform any other functions approved by the Minister (e.g., the voluntary registration of wool classers).

The finance function of the Wool Board includes funding for those activities of the board requiring direct expenditure, derived from:

1. The levy on growers for promotion (percentages of gross proceeds)—about $15.12 million annually, or about 9 cents per sheep.
2. Government contribution for promotion — about $9.52 million annually.
3. Transfers from wool stores rentals.
4. Investment and miscellaneous income.

Total income is around $25.8 million annually. The government's contribution for promotion and the bulk of the other income is remitted to the International Wool Secretariat in London for wool promotion overseas. The balance, about $1,344,000 annually, is expended on promotion, administration, and other activities of the board in Australia, except wool research advice.

The original capital ($134,000) of the Australian Wool Testing Authority was provided by the Commonwealth Government as an interest-bearing repayable loan. The authority's separate income is derived from fees it charges for the services it provides, in the normal commercial manner.

The Wool Research Trust Fund, which is not administered by the board but by the Commonwealth Government, had on June 30, 1964, a capital of about $15,680,000. Income for the fund is derived from:

1. Government contribution (about $2,240,000 annually).
2. Growers' levy (about $1,120,000 annually).
3. Investment and other income.

Total income is about $4,480,000, but withdrawals from the capital reserves from the fund are currently necessary to meet the expenditure of over $6,720,000 annually. The Wool Testing Authority and Wool Research Committees are administered by the board through a series of committees. Some rulings are mandatory, others are not—but all are under the overall policy direction of the board. Thus, Australia has a well-developed organization for the promotion, marketing, and production of wool.

Australian Meat Board

The Australian Meat Board was organized in 1935. Over the years, many changes have been made in its duties and responsibilities. In 1964 the Meat Industry Act was passed by Parliament. The purpose was to reconstitute the meat board, giving it broad powers in beef promotion, research, and marketing, especially in measures to develop overseas markets for Australian meats. Funds to operate the new functions of the board were to be raised by a statutory levy on all cattle (over 200 pounds dressed weight), and on sheep and lambs slaughtered within Australia for human consumption. The levy will be 81.9 cents per head on cattle and 8.28 cents per head on sheep and lambs. Pig meat is not included. This will provide a fund of some $5,600,000.

C. F. Adermann, Minister of Primary Industry, outlined the following main points of the plan:

1. Classes of meat involved: beef and veal, and mutton and lamb (pig meats not included).
2. Reconstitution of the Australian Meat Board to give a more compact board of nine members: chairman, five representatives of meat producers; two of meat exporters, and one of the Commonwealth. The chairman to be appointed by the Minister after consultation with the Australian Meat Board Selection Committee (which has equal numbers of representatives of the two priamry producer organizations previously mentioned). The five meat producer representatives to be appointed from a panel of names submitted by this selection committee. The two exporter representatives to be appointed from a panel of names submitted by the Australian Meat Exporters Federal Council. Members of the board to be appointed for 3 years, but in the initial appointment of producer and exporter representatives, appointment to be made for varying periods of 1 to 3 years each to enable members to retire in rotation.
3. Introduction of a levy on cattle (over 200 pounds dressed weight) and sheep and lambs at point of slaughter for all such stock slaughtered within Australia for human consumption. The levy to be borne by the producer,

to whom it can be passed on by agents and operators. The level of levy to be prescribed on the recommendation of the board after consultation with the main industry organizations concerned and the Australian Cattle and Beef Research Committee. The levy to include the existing beef research levy.

4. The board to be permitted to use the funds collected for purposes other than research in order to undertake additional measures to develop overseas markets for Australian meat and to undertake additional meat promotion in Australia and overseas.
5. Power for the board to purchase and sell meat in its own right, after consultation with the Australian Meat Exporters Federal Council, where there are special marketing problems or market circumstances which preclude the effective participation of private traders. Provision for a consultative committee of four members from each of the Australian Meat Exporters Federal Council and the Australian Meat Board, plus the chairman of the board, to provide a forum for consultation on this matter. The board to have the final decision on whether it shall exercise its trading powers.
6. Power for the board to purchase and sell meat with the approval of the Minister for the purpose of administering any international undertakings to which Australia may be a party.
7. Ability for the board to obtain working funds for the exercise of its powers by obtaining

TABLE 9:—Beef and veal: Australian exports by country of destination, 1957-64[1]

Country of destination	1957	1958	1959	1960	1961	1962	1963	1964
	Mil. lb.[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]
United States	4.5	13.7	128.4	196.8	170.8	338.7	467.7	489.2
United Kingdom	270.0	209.9	333.0	181.5	86.4	78.0	57.4	97.1
Malaya	12.1	11.2	10.6	9.1	8.5	7.3	8.6	8.9
Japan	17.2	6.7	2.7	4.7	7.2	8.9	7.2	10.7
West Indies Federation	2.4	4.3	7.5	5.4	4.3	4.8	4.9	5.8
Hong Kong	9.6	5.6	3.6	2.0	2.6	3.0	2.3	2.6
Western Europe[3]	7.6	6.3	5.2	6.7	2.1	1.5	1.1	2.2
Philippine Republic	8.5	6.0	3.4	2.4	1.4	2.1	2.5	2.6
Other countries	15.0	13.6	15.4	12.2	9.8	14.8	17.7	28.6
Total	346.9	277.3	509.8	420.8	293.1	459.1	569.4	647.7

[1] Year ending June 30. [2] Product weight. [3] France, Belgium, Netherlands, and West Germany.
Source: Australian Meat Board, Sydney.

TABLE 10.—Mutton and lamb: Australian exports by country of destination, 1957-64[1]

Country of destination	1957	1958	1959	1960	1961	1962	1963	1964
Mutton:	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]
United States	.2	11.2	36.4	33.7	36.8	51.6	69.3	42.1
United Kingdom	14.8	25.5	27.4	20.0	16.2	17.9	16.4	11.8
Canada	—	.1	2.1	4.3	10.5	19.0	26.7	24.2
Japan	—	—	—	2.4	4.8	4.4	9.4	42.4
Malaya	1.6	2.7	3.0	3.5	4.7	3.8	4.9	5.7
Other countries	6.9	6.2	6.4	8.9	9.9	16.1	9.0	23.0
Total	23.5	45.7	75.3	72.8	82.9	112.8	137.7	149.2
Lamb:								
United Kingdom	44.6	55.9	75.8	41.5	45.0	27.3	37.6	29.0
Canada	3.7	3.8	7.7	6.8	7.1	3.3	5.6	3.1
United States	1.0	.2	2.4	5.9	5.2	2.1	8.3	1.2
Malaya	1.8	1.8	1.6	1.4	1.8	.9	.9	.9
Other countries	3.2	3.6	3.7	4.7	5.6	4.9	4.8	7.0
Total	54.3	65.3	91.2	60.3	64.7	38.5	57.2	41.2

[1] Year ending June 30. [2] Product weight.
Source: Australian Meat Board, Sydney.

advances from the Reserve Bank under guarantee from the government.

This new legislation gives Australia a well-organized machine for promoting export markets as well as carrying on research and encouraging increased efficiency in the production of meats. The Australian Meat Board controls the exporting of meat and meat products by controlling export licenses.

TABLE 11.—Variety meats: Australian exports by country of destination, 1957-64[1]

Country of destination	1957	1958	1959	1960	1961	1962	1963	1964
	Mil. lb.	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*
U.K.	25.1	24.4	40.7	34.0	24.8	30.6	36.6	35.0
Malaya	1.6	1.6	1.9	1.6	2.0	1.7	2.0	2.2
Italy	.9	.2	1.5	.8	.9	.2	.3	1.7
Other	2.2	2.7	3.0	2.4	2.6	5.5	7.3	8.5
Total	29.8	28.9	47.1	38.8	30.3	38.0	46.2	47.4

[1] Year ending June 30.
Source: Australian Meat Board, Sydney.

Export agreements and legislation

In July 1952, the board negotiated long-term contracts with the United Kingdom known as the 15-year agreement, ending September 30, 1967. The purpose of this negotiation was to encourage increased meat production and to provide an export market for its surplus production. Under this agreement, Australian producers were guaranteed minimum prices for each type of meat. In the event market prices averaged below these minimum prices, the United Kingdom would make payment to the Australian government to make good any deficiency. Australia, in turn, accepted restrictions on exports of beef, mutton, and lamb to markets other than the United Kingdom and certain British colonies and dependencies.

In 1958 a new negotiation was made with the U.K. Government, removing all restrictions on exports of beef and veal under the 15-year agreement.

TABLE 12.—Canned meat: Australian exports by country of destination, 1957-64[1]

Country of destination	1957	1958	1959	1960	1961	1962	1963	1964
	Mil. lb.[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]	*Mil. lb.*[2]
United Kingdom	85.6	105.1	94.1	77.3	44.7	54.8	23.8	25.5
New Guinea	8.3	8.7	7.9	9.2	8.1	7.6	8.3	9.9
Canada	6.5	9.2	9.6	4.6	3.6	7.9	6.3	4.7
Philippine Republic	1.6	3.8	6.0	5.6	2.4	1.2	2.6	4.8
Other countries	7.5	6.5	9.3	8.8	8.1	2.2	8.8	8.5
Total	109.5	133.3	126.9	105.5	66.9	73.7	49.8	53.4

[1] Year ending June 30. [2] Product weight.
Source: Australian Meat Board, Sydney.

TABLE 13.—Tallow, inedible: Australian exports by country of destination, 1957-64[1]

Country of destination	1957	1958	1959	1960	1961	1962	1963	1964[2]
	Mil. lb.	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*
South Africa, Rep. of	7.7	24.9	25.1	31.8	16.3	41.8	52.9	38.4
Japan	10.0	21.2	34.7	31.0	9.6	14.4	45.5	50.8
United Kingdom	20.5	10.0	15.2	17.7	5.0	43.4	22.4	23.1
Malaya	12.8	6.7	5.2	16.0	13.5	10.5	11.4	16.6
Pakistan	4.4	7.6	3.3	12.1	11.7	11.0	10.5	3.5
Ceylon	3.8	1.6	2.1	10.3	5.9	7.3	4.9	8.3
China, Mainland	(3)	1.3	.8	9.1	9.3	22.7	12.7	18.2
Burma	15.8	7.1	5.9	9.0	8.7	9.9	6.7	4.6
India	5.3	2.9	3.0	7.2	3.2	4.1	3.4	5.8
China (Taiwan)	(3)	(3)	2.1	6.2	3.1	.3	2.9	(3)
Rhodesia & Nyasaland	6.2	4.7	4.2	5.0	3.1	4.6	4.1	2.9
Other countries	18.4	10.3	13.0	10.4	19.1	37.5	72.3	49.3
Total	104.9	98.3	114.6	171.8	108.5	207.5	249.7	221.5

[1] Year ending June 30. [2] Preliminary. [3] If any, included in "other countries."
Source: Australia, Commonwealth Statistician, Bureau of Agricultural Economics, Canberra, A.C.T.

TABLE 14.—Wool: Australian exports by country of destination, 1957-64[1]

Country of destination	1957	1958	1959	1960	1961	1962	1963	1964
	Mil. lb.	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*
Japan	237	205	278	340	419	424	393	439
United Kingdom	320	271	330	291	238	223	227	247
France	221	186	162	166	160	144	136	142
Italy	131	137	120	139	114	156	129	136
Belgium-Luxembourg	110	105	105	111	110	110	101	103
Germany, West	93	78	69	80	69	75	82	95
United States	51	35	43	39	36	56	72	50
Poland	32	39	41	37	30	34	22	23
USSR	—	—	—	39	30	41	50	46
Czechoslovakia	17	18	21	30	25	17	16	24
China	6	7	11	26	18	28	32	35
Mexico	11	10	15	10	15	15	15	19
Turkey	2	—	8	10	15	17	25	16
Yugoslavia	3	9	9	10	13	9	15	17
Other countries	66	71	66	67	66	80	66	80
Total	1,300	1,171	1,278	1,395	1,358	1,429	1,381	1,472

[1] Year ending June 30.

Source: *Overseas Trade Bulletin,* Commonwealth Bureau of Census and Statistics.

TABLE 15.—Cattle hides and calf skins: Australian export by country of destination, 1957-64[1]

Country of destination	1957	1958	1959	1960	1961	1962	1963	1964
	Mil. lb.	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*
Japan	6	9	39	25	30	48	69	47
Germany, West	8	12	14	8	3	5	5	11
Italy	10	10	5	5	2	3	3	14
Sweden	3	2	3	3	2	2	3	5
Netherlands	—	6	7	4	2	4	5	5
United King.	6	6	3	2	1	1	1	6
Other coun.	12	6	14	10	4	8	5	21
Total	45	51	85	57	44	71	91	109

[1] Year ending June 30.

Source: Australia, Commonwealth Statistician, Bureau of Agriculture Economics, Canberra, A.C.T.

TABLE 16.—Means of Australian Government estimates for beef and veal production, consumption and exports

Year	Production	Consumption	Canning and exports[1]
	1,000 s. tons	*1,000 s. tons*	*1,000 s. tons*
1963-64	940.8	565.6	375.2
1964-65	980.0	588.0	392.0
1965-66	1,019.2	610.4	408.8
1966-67	1,058.4	632.8	425.6
1967-68	1,097.6	655.2	442.4
1968-69	1,131.2	677.6	453.6
1969-70	1,170.4	694.4	476.0

[1] Includes beef for canning and exports, expressed in carcass weight.

Source: Adapted from projections made by the Australian Bureau of Agricultural Economics, Department of Primary Industry.

This allowed first and second grade beef to be exported to markets other than the United Kingdom; at the same time, it allowed Australia unrestricted rights to sell with a guaranteed minimum price level in the United Kingdom. This relaxation gave a substantial boost to the beef industry by taking advantage of the prices of the lean meat market in the United States.

About 37 percent of Australia's export beef and veal in 1961, and by contrast 71 percent in 1963, went to the United States.

As a result of a voluntary meat agreement with the United States and meat legislation passed by the U.S. Congress in 1964, Australia's meat exports to the United States are now subject to quota allocations, if the U.S. domestic supply situation warrants such action. If this situation occurs the U.S. legislation would limit imports of beef, veal and mutton (lamb is excluded) to about 6.7 percent of U.S. domestic production. Australia's exports of meat to the United States declined in the last half of 1964 and shipments were diverted to the United Kingdom and other Western European countries.

(Because of the temporary shortage of meat then prevailing in Europe, during most of the second half of 1964 prices paid by European importers for Australian beef were above those paid by importers in the United States.)

Foreign Trade

Meat

Foreign trade in beef and veal, mutton, and variety meats shows substantial increases in 1964 over 1951-55 averages (of 316, 403, and 190 percent respectively), while lamb, pork, and canned meats showed declines of 30, 92, and 61 percent respectively. Total meat exports increased 199 percent in 1964 over 1951-55; in this mid-1950 period Australia exported 19 percent of total meat production and in 1964, 25 percent.

The United Kingdom was the main market for Australian beef and veal until 1960, when the United States market surpassed that of the United Kingdom. By 1964, the United States absorbed 57 per cent of the total meat exported. The United Kingdom market took 333 million pounds in 1959 and only 97.1 million in 1964. Beef and veal continued to be the major meats exported in 1964, accounting for 63 percent of the total.

The removal of restrictions in connection with the 15-year agreement with the United Kingdom, coupled with high prices in the United States, brought about this change. Shipments of beef and veal to the United States in 1963 and 1964 were 467.7 and 489.2 million pounds. The latter was an increase of 318.4 million pounds over 1961.

The best market for Australian lamb is the United Kingdom, which took 70 percent of the 1964 export. The major export markets for mutton in 1964 were Japan and the United States, each taking about 42 million pounds.

Costs of moving meat from slaughter plants in Australia to U.S. markets in 1964 were as follows, according to testimony before the U.S. Tariff Commission:

	U.S. cents per lb.
Shipping freight	4.15
Insurance	0.76
Duty	3.00
Pier costs	0.26
Finance	0.42
Storage	0.90
	9.49

This is an increase of 1.24 cents per pound over the 1962 costs.

Wool

Since 1960, Japan has replaced the United Kingdom as the principal market for Australia's wool. In 1963-64, a record 441 million pounds were exported to Japan, or 30.3 percent of total wool exported. The United Kingdom, France, Italy, and Belgium-Luxembourg were the main buyers of Australia's wool, taking 42.7 percent of the 1964 shipments. Sales to the United States have been declining since 1955, except for 1962-63, when 80 million pounds went to that market. Australia is still the largest supplier to the United States of imported apparel wool.

Potential for Increased Production

The potential production of meat and wool in Australia will depend to a great extent on the following:

1. Rate of adopting new practices which pertain to increased production
2. Prices received for commodities both domestic and abroad
3. Credit or funds for clearing, seeding, fertilizing new areas and improving older pastures
4. Government assistance
5. Controlling disease and parasites
6. Increasing per capita consumption
7. Developing new markets

Meat production has increased about 50 percent during the past 10 years. Indications are that further increases will be made by expanding grazing areas, clearing land now in brush, developing water, constructing roads, applying proper fertilizers, reseeding with adapted high producing plants, preparing for droughts, adopting improved animal husbandry practices, controlling disease, and similar measures. Researchers have found the answers to most of these problems and, when these are used, production can be enhanced considerably.

In the Queensland area, there are some 15 million acres of good soil covered with Brigalow—a species of acacia tree belonging to the nitrogen-fixing legume family. This soil will have a high carrying capacity when cleared. About one-third of this area has been developed. North of Perth, in Western Australia, are large areas of sand dunes with adequate rainfall,

TABLE 17.—Cattle price[1]: First and second export quality, 1959-64

Market	1959	1960	1961	1962	1963	1964
	Dol.[2]	*Dol.*[2]	*Dol.*[2]	*Dol.*[2]	*Dol.*[2]	*Dol.*[2]
Sydney	19.23	23.86	25.68	19.10	20.27	20.22
Melbourne	21.22	24.58	27.63	18.87	19.94	21.88
Brisbane	19.43	22.37	22.29	17.75	19.04	20.42
Adelaide	18.26	22.18	25.12	19.32	18.82	20.59
Perth	19.40	21.76	23.32	19.60	19.82	20.08

[1] Ox. 650-700 pounds. [2] Estimated value per 100 lb. dressed carcass weight.

Source: *Annual Report*, year ended June 30, 1964, the Australian Meat Board.

where improved pastures could be established. Only a fraction of this section has been improved. Millions of acres in the 30-inch rain belt in northern Queensland remain to be developed with tropical legumes and adapted grasses. The Murray-Murrumbidgee River Irrigation Project will irrigate about 2 million acres when completed. In Western Australia, the Ord River project will bring about 200,000 acres under irrigation, while the Fitzroy program will add another 600,000 irrigated acres.

In 1960-61, there were 2,022,367 acres under irrigation in Australia. Of this number, 1,355,396 acres were reportedly in pasture. Although crops such as cotton, rice, and safflower are expected to expand, byproducts from these cash crops will be used for livestock feeding.

An improved road system in the Northern Territory, Western Australia, and parts of Queensland would greatly increase and improve the marketing of cattle. Many estimates have been made regarding Australia's prospects for production. The one made by the Australian Bureau of Agricultural Economics, Department of Primary Industry, based on carefully conducted surveys, is used here as an example. These data, as derived by the Bureau of Agricultural Economics, show that beef tonnage is estimated to increase from 980,000 tons in 1965 to 1,170,400 tons by 1970. In early 1965, world cattle numbers were estimated at 1.1 billion head, a reported increase of about 11 percent over the 1956-60 average. High prices for beef and veal, an increase in consumer demand, and a higher purchasing power per capita account for most of this increase.

World sheep numbers also have increased, the largest gains being made in Australia, New Zealand, and the USSR.

Australia exports about 2 percent of all world exports of food and tobacco. It also exports over two-fifths of the world's wool exports and about one-eighth of the world's meat exports. World wool demand is likely to rise by 2 to 3 percent per year during the next decade, most of it in the United States, Japan, and China. Exports of beef and veal to North America over the next 10 years should increase at the rate of 1 to 2 percent per year If the annual growth of income is 2.8 percent in North America and 3.5 percent in Europe, it is estimated that the meat exports into the combined area would be increased about 3 percent per year.

Meat exports to Japan and other Asian countries are expected to rise because of increased population, consumption, and higher living standards. Although the increase in purchasing power may rise slowly in these heavily populated countries, it favors Australia's long-term prospects for meat exports. The continuing world population boom is important to Australia because this is one of the large agricultural surplus-producing areas of the world.

Competition With U.S. Producers

Australia has a very large potential for increasing its production of beef, veal, and mutton in the next 5 to 10 years. This will be brought about by greater land development, use of proper fertilizers, reseeding with high producing legumes and grasses, and water and road development, also by employing improved animal husbandry practices, and by use of well-organized programs through the Meat Board and Wool Board to expand export markets.

This means that Australia will continue to offer competition to the U.S. meat producers. Most of this competition will be in manufacturing meats, such as those coming from canner and cutter cows and bulls, and mutton. Since there is a trend in Australia to market younger animals, and since interest in feedlot finishing is increasing, competition for the U.S. market from this higher quality frozen meat may increase. This is true even though the U.S. housewife demands fresh, highly finished beef. The demand for frozen meat in America is increasing slightly.

In early 1964, a swing of exports away from the U.S. market occurred. This was brought about primarily by a decline in U.S. price.

At present, rising living standards in Europe and decreased production in that area because of temporary weather setbacks have raised both prices and demand. Markets in Japan, Italy, France, Greece, and Peru are expanding. Although some of these new markets may close as Argentine supplies increase, the trend for promoting new markets should stabilize Australia's export market. It must be remembered that in recent years the U.S. market has been profitable for Australian beef, and trade contacts have been established. Therefore, Australian exporters will be inclined to supply this market to the fullest extent possible.

In 1964, the United States exports of livestock, mohair, sausage, lard, meats, hides, skins, and tallow and greases totaled $478.2 million. Since Australia also exports many of these products, it will continue to offer competition in this field.

To some extent, U.S. wool producers are protected from imports of wool from Australia by tariff. The longtime trend in U.S. lamb consumption has been downward, and amounts to only 4 pounds per person, or 2.5 percent of the meat supply.

Since such a small percentage of the U.S. meat supply and its meat consumption is made up of lamb, Australia's competition here is not serious in terms of the total meat market. From the point of view of the American lamb producer, Australian competition for his actual small market can, however, be very serious.

TABLE 18.—U.S. exports of livestock products, 1957-64

Year	Livestock	Mohair	Sausage casings	Lard	Meats	Hides and skins	Tallow and grease	Total
	Mil. dol.	*Mil. dol.*	*Mil. dol.*	*Mil. dol.*	*Mil. dol.*	*Mil. dol.*	*Mil. dol.*	*Mil. dol.*
1957	13.0	11.8	10.2	74.4	86.2	64.9	123.1	383.6
1958	8.4	11.9	11.8	52.0	52.2	53.4	99.3	289.0
1959	16.7	21.6	11.0	60.2	55.8	60.2	116.0	341.5
1960	11.6	15.6	10.3	60.6	61.8	73.3	115.2	348.4
1961	10.4	14.9	15.0	46.7	63.4	80.7	134.6	365.7
1962	9.1	11.1	14.4	40.6	60.2	77.1	106.9	319.4
1963	11.9	14.2	12.5	48.5	85.2	68.3	123.7	364.3
1964	19.2	3.2	9.3	69.8	113.9	83.0	179.8	478.2

Source: Bureau of the Census, U.S. Department of Commerce.

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